

European Patent Application

Sony International (Europe) GmbH

"SOVA Turbo Decoder with decreased normalisation complexity"

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Claims:

- Sub*
- 10 Turbo decoder with at least two effective decoding units using a soft output Viterbi algorithm,  
wherein outputs of the decoding units (25, 26) are normalized by means of normalization units 27),  
characterized in that  
only a subset (25) of the decoding units of the turbo decoder (34) is provided with a  
15 normalization unit (27) at its output side.
2. Turbo decoder according to claim 1,  
characterized in that  
only decoding units (30) being provided with a normalized output of a preceding  
20 decoding unit (25) are not provided with normalization units at their output side.
3. Turbo decoder according to claim 1 ~~or 2~~,  
characterized in that  
it comprises two decoding units (25, 30), wherein only the first decoding unit (25) is  
25 provided with a normalization unit at its output side.
4. Mobile communications device,  
characterized in that  
it comprises a turbo decoder (34) according to ~~any one of the preceding claims~~ <sup>1</sup>  
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5. Turbo decoding method using a soft output Viterbi algorithm,  
wherein a plurality of effective decoding units (25, 30) are used and outputs of the  
decoding units (25, 30) are normalized (27) with a normalization factor,

characterized in that  
only a subset (25) of the decoding units of the turbo decoder is normalized with a  
normalization factor variable during operation and the other decoding unit(s)(30) are/is  
normalized with a time constant normalization factor.

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6. Turbo decoding method according to claim 5,  
characterized in that  
time constant normalization factor is equal to one.

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7. Turbo decoding method to claim ~~5 or 6,~~  
characterized in that  
only decoding units (30) being provided with a normalized output of a preceding  
decoding unit (25) are normalized with a time constant normalization factor.

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8. Turbo decoding method according to ~~any one of claims 5 to 7,~~  
characterized in that  
two decoding units (25, 30) are used, wherein the first decoding unit (25) is normalized  
(27) with a normalization factor variable during operation and the second decoding unit  
(30) is normalized with a time constant normalization factor.

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9. Turbo decoding method according to ~~any one of claims 5 to 8,~~  
characterized in that  
the normalization factors are calculated on the basis of the means and variance of the  
extrinsic information produced by the associated decoding unit.

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10. Turbo decoding method according to ~~any one of claims 5 to 9,~~  
characterized in that  
it is performed as a parallel concatenated scheme.

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